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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/763,044	01/22/2004	Olivier Pizzuto	02-RO-250	3798

23334 7590 11/04/2005

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EXAMINER	
KIM, SU C	

ART UNIT	PAPER NUMBER
2823	

DATE MAILED: 11/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/763,044	PIZZUTO ET AL.	
	Examiner	Art Unit	
	Su C. Kim	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 August 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) *20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8/2/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

REMARK / ARGUMENT

REMARK

By the response of Office action dated 05/23/2005:

Specification is amended.

Claim 19 is amended.

By amendment of specification, drawing objection has been withdrawn.

Response to Amendment

Applicant's amendment was received on 08/23/2005, and has been entered and made of record. Currently, claims 1-19 are pending.

Specification

The corrected or substitute specification was received on 08/25/2005. The specification is acceptable.

Drawings

The corrected specification was received on 08/25/2005. The drawing objection is withdrawn.

Claim Objections

By the corrected claim amendment, Claim objection has been withdrawn.

DETAILED ACTION

Response to Amendment

Applicants contend that Subramanian (US 6348406) herein know as Subramanian fails to teach "an attack of the formation zone and of the protective resin so as to result in a deposit from the protective resin below the precursor stacks" as recited from claim 1

In response to applicants contention that Subramanian fails to teach "an attack of the formation zone and of the protective resin so as to result in a deposit from the protective resin below the precursor stacks" as recited in claim1. Applicants are severely mistaken the teachings of Subramanian although the prior art does not use non-inventive terms such as attack, protective resin and formation zone, Applicants invention is merely nothing more than a fabrication process for a memory device and specifically the memory device is merely nothing more than a memory device comprising a floating gate associated with a trench.

Furthermore, Applicants contention that by using the term "Attack" is merely nothing more than an etching step and if this is contrary to Applicants invention, then Applicant's have failed to seek enforceable terms for the claimed invention.

Applicants have merely reworded a common process of forming a memory device and believe that attacking the prior art based on claim terminology will over-come the rejection. Subramanian teaches that a by-product of existing etched layers exit which is merely nothing more than Applicants deposit of residue from the protective

resin. Applicants' term for protective resin is merely nothing more than a polymer as described by Applicants' disclosure. It is well known that photoresist is a material composed of a polymer and since Applicant have focused on this issue, the Examiner has provided several prior art references in which photoresist is merely nothing more than a polymer. One of many example to use polymer as photoresist Renaldo et al. (US Pub 20030194657) disclose photoresist polymer (Column 3 paragraph [0033] line4).

Applicants arguments have been noted, however, Applicants precursor stack in nothing more than a stack layer of materials, which have been conformally deposited prior to etching (which is commonly used term in the art or attacking as suggested by Applicants terminology).

Applicants contend that Subramanian fails to remove any deposit residue.

This argument is contentious at best Subramanian suggest that the actual removal process causes problems (Column 3, lines 38-47). Therefore, Applicants arguments are moot. Furthermore, because of the stacks are formed before implantation, it is well know that implantation regions 204 are merely source/drain regions. Applicants have failed to overcome the prior art teachings and amendments to the claims are necessary.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

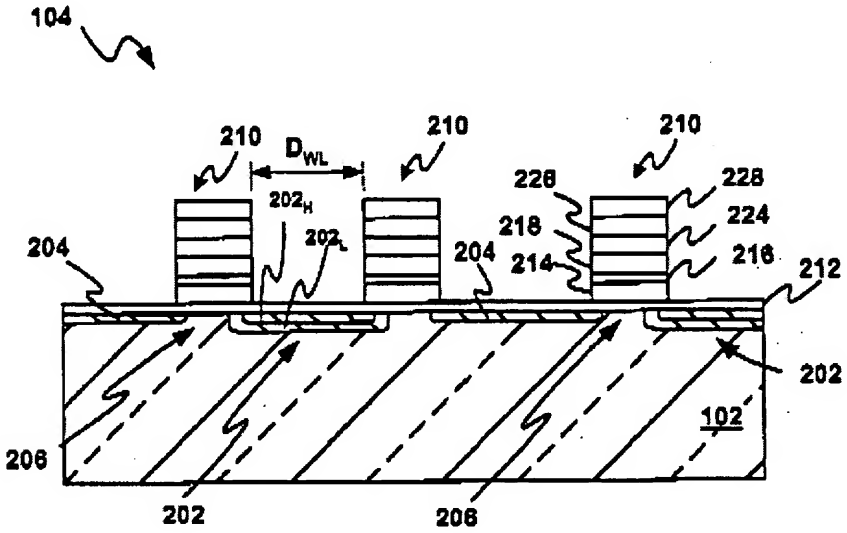

FIG. 2C (PRIOR ART)

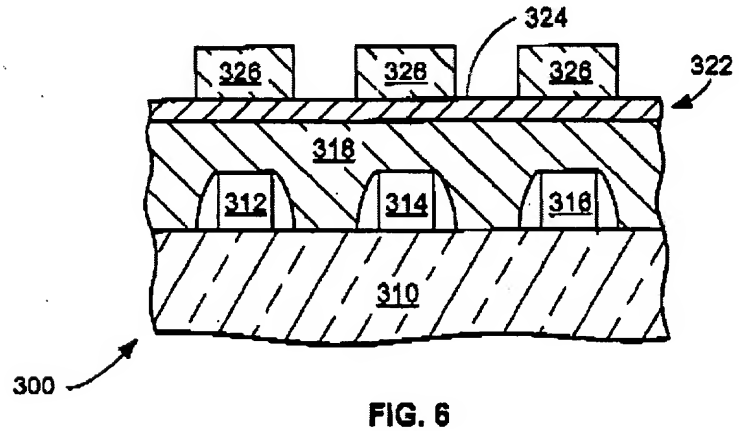

FIG. 6

Subramanian discloses a method for flash memory process as claimed. **See all FIGS**, where Subramanian teaches the following claims.

1. Claims 1-4, 13,14, &18 are rejected under 35 U.S.C. 102(b) as being anticipated by Subramanian et al (US 6,348,406 B1).

Pertaining to claim 1, Subramanian discloses a method for producing a flash memory comprising:

forming at least two adjacent rows of precursor stacks of floating gate transistors **214** on a semiconductor substrate **102**, with the precursor stacks **210** being at least partially covered by a protective resin **212 & 318** and being separated by a formation zone for a source line **202 ;**

forming a trench **202** in the formation zone for the source line **202** by an attack of the formation zone and of the protective resin **212 & 318** so as to result in a deposit of residue from the protective resin below the precursor stacks **(Column 7 lines 26-29, please note the claim 1 directly refers to self-aligned source etching process)**;

removing the deposit of residue deposit **(column 2 lines 30-34)**;

and implanting a source line **202** in the formation zone below the precursor stacks **(column 7 lines 36-52, please note Subramanian teaches to form source and common line CS).**

2. Pertaining to claim 2, Subramanian discloses the method of claim 1, wherein the forming a trench **202** includes forming a trench which is the type having of (SAS) self-aligned source **(column 7 lines 32-33)**.

3. Pertaining to claim 3, Subramanian discloses the method of claim 1, wherein the forming a trench **202** includes forming a trench so as to result in the protective resin **212 & 318** formed from a thick DUV resin **322 (Column 8 lines 18-27, also note Anti-reflective coating (ARC) layer is typically a polymer film, which is highly absorbing and non-bleaching at the exposure wavelengths associated with the photolithographic process)**.

4. Pertaining to claim 4, Subramanian discloses the method of claim 2, wherein the forming a trench **202** includes forming a trench so as to result in the protective resin formed from a thick DUV resin **322**.

wherein for each of the precursor stacks, the drain **204** is formed opposite the formation zone for the source line **202**.

5. Pertaining to claim 13, Subramanian disclose the method of claim 1, further comprising:

removing the protective resin **212 & 318** following implantation of the source line **202**.

6. Pertaining to claim 14, Subramanian discloses the method of claim 4, further comprising:

removing the protective resin **212** following implantation of the source line **202**.

removing the protective resin **212** following implantation of the source line **202**.

7. Pertaining to claim 18, Subramanian the method of claim 1, wherein the implanting the source line **202** includes doping the source line with arsenic **(Column 7 lines 50-51)**.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Subramanian (US 6348406) in view of Tanaka et al. (US PUB 2003/0165750)

8. Pertaining to claim 5, Subramanian discloses, wherein the forming a trench **202** includes forming a trench so as to result in the protective resin **212 & 318** formed of DUV resin.

However, Subramanian does not disclose the method of claim 1, wherein the forming a trench **202** includes forming a trench so as to result in the protective resin formed of thick I-line resin.

Tanaka teaches the method of claim 1, wherein the forming a trench **202** includes forming a trench so as to result in the protective resin formed of thick I-line resin **(column 6 lines 48-54)**.

Subramanian and Tanaka are analogous art because they are from the same field of endeavor and the masking process.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to the method of claim 1, wherein the forming a trench includes forming a

trench so as to result in the protective resin formed of thick I-line resin, instead of forming DUV resin because of inexpensive I-line lithography fabrication.

Therefore, it would have been obvious to combine Tanaka with Subramanian for the benefit of inexpensive lithography fabrication process to obtain the invention as specified in claim

9. Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Subramanian in view of S. Wolf **(Page 564-565 lines 8-17 & lines 6, Silicon Processing for the VLSI Era Vol. 1 by S. Wolf, please refers one of conventional dry etching process: Organic film etching process).**

Pertaining to claim 9, Subramanian discloses the method of claim 1, wherein the removing the deposit of residue includes removing the deposit of residue.

However, Subramanian does not teach the removing the deposit of residue includes removing the deposit of residue by generating dioxygen plasma.

S. Wolf teaches removing the deposit of residue includes removing the deposit of residue by generating dioxygen plasma.

Subramanian and S. Wolf are analogous art because they are from the same field of endeavor and the name of the field Organic film etching process.

At the time of invention it would have been obvious to a person of ordinary skill in the art to removing the deposit of residue includes removing the deposit of residue by generating dioxygen plasma because organic etching process is a highly selective method for removing organic material. **(S. Wolf, volume 1 Page 564 lines19-20, please note applicant disclose the polymer can be removed especially by means of adequate dioxygen plasma and the polymer is an organic material).**

Therefore, it would have been obvious to combine Subramanian in view of S. Wolf for the benefit of providing a highly selective method for removing polymer and its residue.

Claims 8,15,16, 17, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Subramanian (US 6,348,406).

10. Pertaining to claim 8, Subramanian discloses the method of claim 6, wherein the forming at least two adjacent rows of precursor stacks of floating gate transistors **210** on a semiconductor substrate **102** includes forming a semiconductor substrate with a drain **204** for each precursor stack, wherein the drain is covered in a resin **212 & 318**; and

wherein for each of the precursor stacks, the drain **204** is formed opposite the formation zone for the source line **202 (Although Subramanian teach claim 8, it is rejected under 35 U.S.C. 103 (a) because it is dependent claim of 6).**

11. Pertaining to claim 15, Subramanian discloses the method of claim 6, further comprising:

removing the protective resin **212** following implantation of the source line **202 (Although Subramanian teaches claim 15, it is rejected under 35 U.S.C. 103 (a) because it is a dependent claim of 6).**

12. Pertaining to claim 16, Subramanian discloses the method of claim 8, further comprising:

removing the protective **212** resin following implantation of the source line **202 (Although Subramanian teaches claim 16, it is rejected under 35 U.S.C. 103 (a) because it is dependent claim of 8).**

13. Pertaining to claim 17, the method of claim 12, further comprising: removing the protective resin 212 following implantation of the source line 202 **(Although**

Subramanian teaches claim 17, it is rejected under 35 U.S.C. 103 (a) because it is dependent claim of 12).

14. Pertaining to claim 19, Subramanian the method of claim 1, wherein the implanting the source line includes implanting the source line 25 nanometres out from an edge under a gate oxide of the precursor stacks.

Given the teaching of the references, it would have been obvious to determine the optimum thickness, temperature as well as condition of delivery of the layers involved. *See In re Aller, Lacey and Hall* (10 USPQ 233-237) "It is not inventive to discover optimum or workable ranges by routine experimentation. Note that the specification contains no disclosure of either the critical nature of the claimed ranges or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. *In re Woodru* ; 919 f 2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Any differences in the claimed invention and the prior art may be expected to result in some differences in properties. The issue is whether the properties differ to such an extent that the difference is really unexpected. *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986)

Appellants have the burden of explaining the data in any declaration they proffer as evidence of non-obviousness. *Ex parte Ishizake*, 24 USPQ2d 1621, 1624 (Bd. Pat. App. & Inter. 1992).

An Affidavit or declaration under 37 CFR 1.132 must compare the claimed subject matter with the closest prior art to be effective to rebut a prima facie case of obviousness. *In re Burckel*, 592 F.2d 1175, 201 USPQ 67 (CCPA 1979).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Su C. Kim whose telephone number is (571) 272-5972. The examiner can normally be reached on Monday - Friday, 8:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S. Smith can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Su C. Kim
10/31/2005

W. David Coleman
Primary Examiner